DOCUMENT RESUME

ED 088 811 SP 007 778

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TITLE Design for Effective Staff Development.
PUB DATE Apr 74
NOTE 33p.; Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, Illinois, April 15-19, 1974

EDRS PRICE MF-$0.75 HC-$1.85
DESCRIPTORS *Behavior Change; Educational Research; *Inquiry Training; Skill Development; Student Teacher Relationship; *Teacher Education; Teacher Role

ABSTRACT

This paper presents a model for designing an effective staff development program. The rationale, philosophy, and instructional design utilized in the instructional Staff Development (ISD) program provides the basis for the design presented. The ISD program was conceptualized, developed, pilot tested, and field tested as a cooperative research project of the Mid-continent Regional Educational Laboratory located in Kansas City, Missouri and the University of Nebraska-Lincoln's Teachers College. It was designed to avoid some of the common criticisms of in-service programs and to utilize the best information available to create a climate of change. Each component of the program was designed with the following sequential elements: sensitization, instruction, practice, implementation, and assessment. (Author/DDO)

Section 11.10

ED 088811

DESIGN FOR EFFECTIVE STAFF DEVELOPMENT

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Presented at the
Annual Meeting
of the

AMERICAN EDUCATIONAL RESEARCH ASSOCIATION

Palmer House
Chicago, Illinois

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INTRODUCTION

The purpose of this paper is to present a design for effective staff development. The rationale, philosophy and instructional design utilized in the Instructional Staff Development (ISD) Program will provide the basis for the design presented. Although the basic model was developed as part of a specific research project, it appears to have potential for application to other development programs or efforts.

The ISD program was conceptualized, developed, pilot tested and field tested as a cooperative research project of the Mid-continent Regional Educational Laboratory located in Kansas City, Missouri, and the University of Nebraska-Lincoln's Teachers College. The results of the field test are reported in the 1971-72 ISD Field Test Assessment Report.[1] Assessment data related to specific teacher and student behaviors are also reported in papers by Lux,[2] Joekel[3] and Wright.[4]

NEED FOR STAFF DEVELOPMENT

If one can judiciously assess the movements within education and is aware of the demands being brought to bear upon educators by the public, a likely prediction for the future is that the teacher will play a greater multiplicity of roles than in the past. Teachers are faced with the task of inducing social

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[1]Delivee L. Wright, John E. Lux, Alan T. Seagren, Ronald Joekel, 1971-1972 ISD Field Test Assessment Report, Mid-continent Regional Educational Laboratory, Kansas City, Missouri, 1972.

[2]John E. Lux, "Developing/Modifying Student Affective Behaviors," paper to be presented at AERA, Chicago, April, 1974.

[3]Ronald Joekel, "An Analysis of Teachers Verbal Inquiry Behaviors Using the Inquiry Analysis System," paper to be presented at AERA, Chicago, April, 1974.

[4]Delivee Wright, "An Analysis Of Teacher And Student Verbalization Of Cognitive Inquiry Behaviors Before And After Participation In the McREL ISD Program In Inquiry," paper to be presented at AERA, Chicago, April, 1974.

mobility and providing a means for gaining better living conditions and a more satisfying life. Furthermore, they are faced with the demand to aid in the preservation of the democratic form of government in the United States and at the same time are expected to encourage their students to look at all sides and to inquire into all facets of pertinent issues.

To enable the teacher to respond to the aforementioned demands, he must no longer be primarily a dispenser of information or a trainer in the use of a limited set of skills. Educational technology promises to develop sophisticated instructional systems that will partially replace the dispensing-training functions now delegated to the teacher. Programmed instruction and computer assisted instruction will be used to present information and pose questions based on a student's prior knowledge, leading him through a systematic program allowing maximum student gain for time and resource allotted. The typical student in the school of the future may receive much of his education by mechanized means at an input-output computer station which will closely approximate the ideal tutor.

The objective of such innovations are to individualize instruction to accommodate different student aptitude and interests and to increase student participation in the learning process. Under these circumstances the role of the teacher will change to an emphasis on diagnosing pupil strengths and weaknesses, prescribing appropriate instructional tasks, providing individual assistance to enable students to complete tasks, and offering guidance within a warm, interpersonal relationship. Teachers will probably make greater use of small group settings requiring interpersonal skills and understanding of the social behaviors and social processes in group situations. An increasingly significant need in our complex society is for individuals to participate effectively in groups engaging in problem solving, decision making, and

negotiating. It would appear that a major role of the teacher of the future will involve providing educational experiences relevant to group processes.

It would appear that today's students are "role rather than goal oriented." Glasser[5] discussed this concept in a speech in which he analyzed that students had to find their role before any type of goal orientation was appropriate or meaningful. Teachers, therefore, must design learning experiences from a different point of view than the traditional, goal oriented motivational instructional strategies, and means of evaluation currently being utilized.

The role of the teacher is also changing in relationship to and interacting with parents in the community. Parents are expecting and even demanding that the professional knows specifically what he is about, how he plans to proceed and how he evaluates what took place.

In summary the teacher of today and the future should not be primarily an imparter of information. He must be a determiner of educational climate, a learning engineer and a designer of learning experiences.

Teacher preparation in the past has not been adequate to prepare teachers for the new roles they will be expected to perform. As described above it would be indeed fortunate if we could concretely and for all time specify the kinds of training experiences necessary to provide teachers with the knowledge, skills, and behaviors appropriate for the new and constantly changing roles that they will be required to perform. Unfortunately the information is not available to enable final answers to be determined as the demands and wishes of society constantly change. Teacher education programs will evolve on the basis of the best research evidence available and constantly be revised and

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[5]William Glasser, "Schools Without Failure," speech given at Phi Delta Kappan breakfast, October 23, 1969, Lincoln, Nebraska.

modified. However, this task will never be completed. There will be a continuing need on the part of professionals for the acquisition of new knowledge, skills, and behaviors appropriate for the demands of society.

Therefore, it appears there will be a continuing need for staff development programs which are designed to improve the effectiveness and increase the competencies of professional educators. Programs designed should provide educators with the skills required to meet the changing demands of society and incorporate the most current materials and procedures.

RATIONALE FOR THE ISD PROGRAM

Within this broad context the ISD program was conceived. The broad goal of this program was to train teachers to exhibit behaviors which lead to inquiry skill development in students. The focus on inquiry should not be interpreted as meaning that the developers of the ISD program feel that the inquiry process is the only answer to providing meaningful, relevant educational experiences for students. The developers recognize that inquiry teaching is one technique which may or may not be more appropriate than others. However, the inquiry process is the primary focus of the ISD program.

The ISD program proceeds from the frame of reference that it is not only important for a teacher to be able to control his behavior in certain specified ways but it is equally important that the teacher understands and is capable of selecting from a wide range of alternatives the strategy which is most appropriate in terms of the objectives and the type of students with whom he is attempting to communicate and relate. Therefore, this program differs from some skill training programs in that the program attempts to provide a broad base of understanding of teaching skills and behaviors as well as training in specific skills needed to elicit behaviors related to inquiry. The intent is that teachers must have an understanding of the total context within which

specific strategies function in order to be more than technicians and to be responsive to feedback and input from students in terms of the objectives when making decisions and selecting alternate strategies.

Staff development programs for teachers have traditionally concentrated on the teaching process or the curriculum to be taught or both elements. In the ISD program, the emphasis is primarily on the process of teaching with curriculum considerations entering only in Component IV. This does not imply that the development of curriculum materials and the study of new content is not important, but it does recognize our belief that individual staff development programs must focus on one major aspect of teaching to be successful. Evidence from the past curriculum innovations indicates that success is contingent upon the ability of teachers to control and modify their behavior so it is congruent with: (1) the intent of the material being utilized, (2) the theory behind these materials, and (3) the activities designed to accomplish the major objectives of the curriculum. The ISD program emphasizes the process of teaching and focuses on influence pattern, inquiry skills, structuring and organizational skills, inquiry strategies, inquiry phases, inquiry planning, and affective behaviors.

The program attempts to help a teacher recognize what he is doing and how his behaviors might be modified to improve learning.

The program recognizes that many teachers have had little or no experiences in inquiry teaching and that their style of teaching is normally of an expository nature.[6] This program has been designed to assist teachers to modify their instructional behavior moving step by step from the non-inquiry expository

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[6]Elbert D. Brooks, "The Effect of Alternative Techniques for Modifying Teacher Behavior," abstract, 1967, p. 13 and Edmund J. Amidon and Ned A. Flanders, The Role of the Teacher in the Classroom, Minneapolis: Paul S. Amidon and Associates, Inc., 1963, p. 44.

strategies of lecture and recitation into the teacher directed inquiry strategies of Teacher Directed Inquiry and Toward Student Directed Inquiry and then to Pupil Centered Inquiry.

Teachers are decision makers. They become better decision makers when they are capable of selecting and using the best strategy available to them in accordance with the objective of the learning experience.

PHILOSOPHY

The philosophy underlying the ISD program is that the training and experiences provided for teachers should model and utilize skills and behaviors which teachers are expected to utilize with students in their classroom. In other words ISD proceeds from the philosophy of inquiry into inquiry. As defined earlier, the ISD project involves the development of autonomous inquirers who have the understanding and skill to function independently of a tightly controlled learning environment. Through the concept of inquiry into inquiry, the same learning conditions are created for participants in the training program through open active dialogue, and freedom to inquire, explore, and accommodate according to their individual needs and abilities.

Smith expanded on the concept of inquiry into inquiry as it affects training for teachers. He wrote:

> The behavior changes necessary for teachers to function effectively in the new curricula require a new approach to the preparation of teachers that must of necessity take into consideration the modern conception of knowlege as invented rather than discovered Teacher educators have an obligation to see that the prospective teacher comes to have an understanding of how and for what purpose our concepts were formulated, how they were validated, and what effect the formulation and validation have on the application of these concepts in an educational setting. This suggests that we attempt to devise and validate an inquiry approach to teacher education.[7]

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[7]Richard B. Smith, "The Implication of Inquiry Structures for the Teacher Education Curriculum", The Journal of Teacher Education XXX (Fall, 1968) p. 343.

By design, the trainers will "model" the openness of an inquiry situation, will recognize the participants as decision-makers, and will provide data in response to questions and problems. This philosophy presents certain kinds of problems in the development of training materials since the types of experiences, materials utilized, and the alternatives cannot be limited. The trainer must select from alternatives the strategy which seems most appropriate on the basis of feedback from participants in the training program. The training utilized the process of active inquiry. It is assumed that comprehension of the nature and uses of the knowledge acquired will be increased; furthermore, the development of skills in applying this knowledge will be reinforced.

ASSUMPTIONS RELATED TO THE ISD PROGRAM

The ISD program is based on the following assumptions:

1. Teacher Behavior Can Be Modified and Changed.

Flanders, in 1962, made several assumptions that were basic to teacher behavior. These included that only a teacher can change his own behavior; that changes can occur in teaching methods; that no one pattern of teaching can be adopted universally by all teachers; and that the most effective environment for change allows for freedom of people to express their feelings and ideas, encourages self-direction and is free of coercion.[8]

Amidon and Flanders summarized the results of a number of studies involving modification of behavior:

> Student teachers who had been taught interaction analysis differed significantly from those who had been exposed to traditional teacher education programs.[9]

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[8]Ned A. Flanders "Using Interaction Analysis in the In-service Training of Teachers," Journal of Experimental Education, 30: 313-6, 1962.

[9]Amidon and Flanders, op. cit., The Role of the Teacher in the Classroom, 1967, p. 90.

Teaching is a specific form, or set of forms, of habitualized human behavior. It is observable, measurable, analyzable, differentiatable, and modifiable.[10]

Only the teacher can make changes in his classroom behavior. Others may help in the process of change, but they cannot do so unless the teacher himself desires a change. The desire to understand and improve ones own behavior is . . .the major prerequisite of behavior change.[11]

2. Behavioral Analysis of Teaching is Both Desirable and Necessary for a Change of Teacher Behavior.

The teacher. . .is continually exerting influence on the children and on the learning situation. . . . By studying his own behavior in some systematic, objective manner, the teacher may gain further insight into his own pattern of influence. As he gains insight into his behavior, he may decide. . .that he wants to change his behavior because either he is not achieving what he thought he was achieving, or he is not achieving what he has decided he wants to achieve on the basis of new insights about how children learn.[12]

When one says that teaching is a set of habits, one is also implying that such behavior is most imitable. Habits can be changed. Though they can become remarkably resistant to alteration, teaching styles are not necessarily fixed for all time. Almost everyone who has worked as a teacher or with teachers over a long enough time has been able to see his own and other styles undergo some change usually very gradually but sometimes with startling suddenness.

All too often efforts to bring about change in deeply ingrained habits are rather naive and superficial in approach. The teacher concerned seldom has seen what his present habits are clearly and in enough detail that he can begin to grapple realistically with them. And the alternative styles to which he might move are discussed in vague and fuzzy language. It would be my contention that the specific analysis of teaching habits provides the most adequate and efficient basis for intelligent change.[13]

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[10]Gale W. Rose, "Performance Evaluation and Growth in Teaching," Phi Delta Kappan XLV (October, 1963), p. 49.

[11]Edmund J. Amidon and Ned A. Flanders, The Role of Teacher in the Classroom Revised Edition, (Minneapolis, Minnesota: Associations for Productive Teaching, Inc., 1967) p. 2.

[12]Ibid., pp. 1-2.

[13] Rose, op. cit., p. 50

3. Teachers are concerned about their behaviors and the influence which they have on students in the classroom and they are interested in improving their performance (behavior) through a process of self analysis.

> Teachers have never had an empirically verified theory to serve as a basis for their classroom behavior. Yet, perceptive teachers have sensed that the quality and quantity of teacher-pupil interaction is a critical dimension of effective classroom teaching.[14]

> Without a way of objectively describing the nature of classroom interaction, teachers in the past have had no way of capturing the elusive phenomenon of their instructional behavior, the climate that it creates in their classroom, and the effect of this climate on student attitudes and achievement.[15]

> Apparently teachers have a great interest in and need for objective information about their own patterns of influence, how these patterns match their intentions, and whether the differences they expected from different patterns did or did not occur.[16]

4. Providing teachers with information about their teaching performance in the form of feedback is important if teachers are to modify their behaviors.

> The communication of data about the effect of a person's behavior on others back to that person is termed feedback. It is an essential aid to the teacher who is trying to understand and improve his classroom behavior. Programs organized for helping teachers to understand their behavior and to plan behavior change must have provision for an effective feedback system.[17]

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[14] Edmund J. Amidon and John B. Hough, Interaction Analysis: Theory, Research, and Application (Reading; Mass: Addison-Wesley Publishing Company, 1967), p. 2.

[15] Ibid, p. 2.

[16] Ned A. Flanders, Teacher Influences, Pupil Attitudes, and Achievement, U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Monograph No. 12, 1965, p. 44.

[17] Amidon & Flanders, op cit, p. 4.

5. Teachers can be assisted by supervisors in the process of analysis and assessment if the supervisor focuses on specific kinds of teaching behaviors.

> . . . the best function of the so-called "supervisor" by teachers would be precisely the function of providing complete, accurate feedback of the teacher-pupil situation and the supplying of a range of alternatives to unsuccessful procedures. Perhaps it is rather silly to urge teachers to "improve" until they know quite specifically what it is that is not working and what other ways of working are available.[18]

6. Teachers must have a broad understanding of the instructional process in order to select the alternative which is most appropriate on the basis of objectives and students.

> Where several alternative patterns of behavior on the part of the teacher are likely to be equally successful in producing the desired learning condition, then that one which is most easily generated in teachers should be specified in the method.[19]

> By analyzing their classroom behavior and reflecting on alternate approaches to teaching specific lessons, this could possibly lead the teacher to higher level objectives, methods, and expressions that would maximize the potential for stressing more cultural values in approved ways, teaching could become more effective. Thus, teachers could become more efficient at carrying out the socialization process in the classroom.[20]

DESIGN OF INSTRUCTION

One of the difficulties in staff development programs in the past has been that they have focused on providing only information or instruction to teachers. Too often little or no consideration has been given to assisting teachers in practicing new skills, implementing these skills in the classroom and assessing the effectiveness of the alternatives selected. The design of instruction for

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[18]Gale W. Rose, "Performance Evaluation and Growth in Teaching," Phi Delta Kappan XLV (October, 1963), p. 52.

[19]Norman E. Wallen and Robert M. W. Travers, "Analysis and Investigation of Teaching Methods," "Handbook of Research on Teaching," ed. N. L. Gage. (Chicago: Rand McNally and Company, 1963), p. 485.

[20]Wayne Roberson, "The Preparation of an Instrument for the Analysis of Teacher Classroom Behavior," (unpublished dissertation, University of Arizona, 1967), p. 68.

each of the components of this program proceeds from five basic and sequential steps illustrated in Figure 1 on page 12.

Step 1. Sensitization - (an awareness of specific behaviors or skills). In this particular part of instruction the emphasis is on making teachers aware that there are many alternatives or strategies which might be employed in any given teaching-learning situation making them aware of the kinds of behaviors and skills which might be appropriate within these strategies. The intent here is on motivation to stimulate and expand their thinking. Consideration must be given to entry level and levels of readiness. The range of competencies of any group of teachers is as wide or large as the range in any group of students. Consideration needs to be given to this range and experiences designed and provided to reach a broad range of levels of readiness.

Step 2. Instruction - (knowledge and understanding of specific skills or behaviors). In this phase of instruction the emphasis is on the particular skills or behaviors which have been identified as being appropriate for that component. This is the most structured part of the design. However, even in this part actual examples of teachers who are participating in the program are used as indicators of progress and level of readiness. It has been found that by using actual classroom tapes or practice tapes of the participants in the program as a part of instruction the acceptance of the instructional program has been enhanced and level of readiness can be identified and instruction can begin from that point.

Step 3. Practice - (the opportunity to try in controlled situations the behaviors or skills). The recognition of the importance of practicing specific skills and behaviors has always existed. Too often this dimension has been ignored and we have assumed that teachers can implement new skills and behaviors in the classroom after they have received instruction or have some

THEORY ⟶ PRACTICE

Model 1

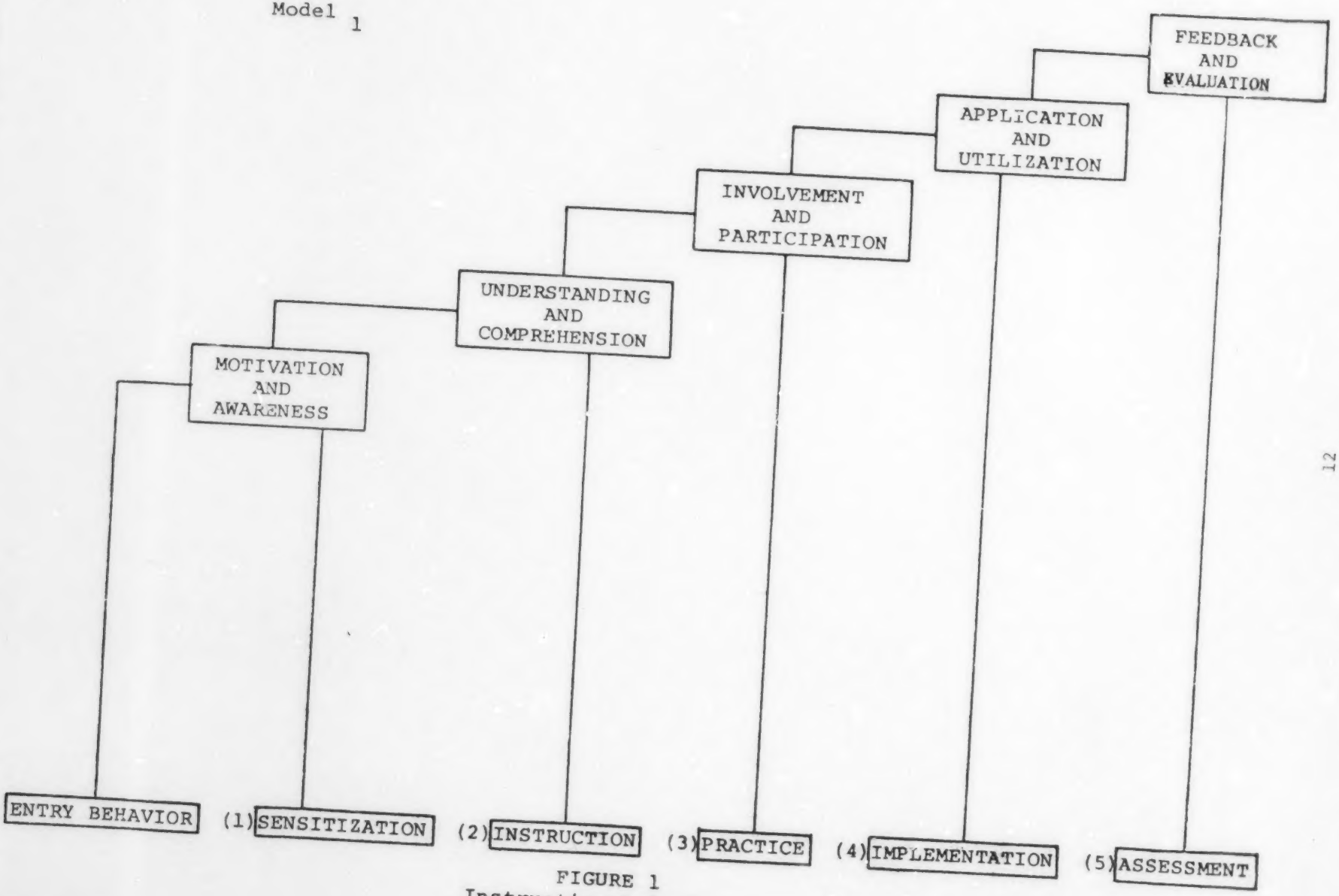

FIGURE 1
Instructional Design

cognitive knowlege about a teaching stratagem. When attempts are made to change or modify behavior the results are not always successful and frustration results. The importance of practice in the preparation of teachers was enhanced through the studies by Allen and associates concerning the Micro Teaching Technique at Stanford University.[21] In this program the intent is that participants will have an opportunity to practice the skills or behaviors for which they have received instruction in controlled or ideal situations. In most components micro teaching is conducted with small groups of students from the classrooms of the participants and done in the school where the teacher is functioning. This is an important dimension of the design and a part of many of the components is a debriefing session following the practice sessions. In the debriefing session the emphasis is on the ability of teachers to perform, to raise questions and seek clarification about the instruction which they have previously received.

Step 4. Implementation - The focus here is putting into operation the skill or behavior in the normal classroom situation. In the practice session the focus was only on the particular behavior or skill being studied or analyzed. The emphasis in this phase is that if teachers have successfully mastered the skill or behavior, they should be able to incorporate this specific behavior or skill within their total repertoire of skills and behaviors. This step also is related to the ability of teachers to select that alternative which might be most appropriate within a given situation. Steps 3 and 4 provide opportunities to individualize the instruction. Levels of expectation and performance should be realistic in terms of entry behavior and levels of readiness. These two steps also provide opportunities for the development of speciali-

[21] Dwight Allen and Kevin Ryan, Microteaching, Reading, Massachusetts: Addison-Wesley Publishing Company, Inc., 1969.

zation in certain behaviors or skills.

Step 5. Assessment - Two types: (1) How effective was the alternative (skill or behavior) selected in accomplishing the intended goals? (2) How effective was the teacher in controlling his behavior or utilizing the skills as intended? In the assessment part of the design consideration must be given to the setting in which the teaching episode took place. Some determination must be made as to the effectiveness of the alternative selected. This determination is often made by the participants. Sometimes the trainer being aware of the circumstances and situation of the teaching episode may think that another alternative may have been more appropriate. Therefore, the participants must have a major impact on this. The real emphasis of this step is on feedback and self-assessment. The teacher is asking, were desired outcome results achieved, and secondly analyzing his behavior in terms of contribution, or distraction, from learning outcomes.

PURPOSE OF THE ISD PROGRAM

The purpose of the ISD program is to train teachers to utilize behaviors which encourages inquiry skill development by students. The program involves six sequential components moving from an orientation to inquiry to the development of pupil inquiry behaviors.

GENERAL GOALS OF THE ISD PROGRAM

The ISD program is based on the idea that certain knowledge, skills, and attitudes are necessary to develop the teacher behaviors required to implement inquiry teaching. As teachers proceed through the six components, the program focuses on achieving the following general goals:

1. Teachers recognize they can control and modify their instructional influence behaviors.

2. Teachers have an understanding and knowledge about the inquiry process.
3. Teachers recognize the importance of various inquiry skills and can use these skills in their teaching.
4. Teachers recognize the various phases of inquiry and can use these phases in the classroom.
5. Teachers recognize the cognitive or structuring skills and affective behaviors that are conducive to inquiry and can use these skills and behaviors in the classroom.
6. Teachers recognize the importance of inquiry planning and planning related to both content and process.
7. Teachers recognize the various strategies for inquiry and can use these strategies in the classroom.

DEFINITION OF TERMS

For purposes of the ISD program these terms are defined as follows:

1. Inquiry - A set of activities directed towards solving an open number of related problems in which the student has as his principal focus a productive enterprise leading to increased understanding and application.[22]

2. Skills or Behaviors - For the purpose of the ISD project, skills and behaviors are used interchangeably. In examining and analyzing the teaching-learning process, a number of activities can be isolated which divide the teaching act into smaller units. A skill or behavior is a component part of the larger Gestalt of the teaching act. Skills or behaviors can be macro or micro in nature. Once the skills or behaviors have been identified they become useful vehicles for analyzing and describing the teaching act and provide a focus for practice in attempting to improve the teaching act.

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[22]Richard M. Bingman, ed., Inquiry Objective in the Teaching of Biology, Kansas City, Missouri: Mid-continent Regional Educational Laboratory, 1969, p. 1.

3. Inquiry Skills - For the ISD project, inquiry skills consist of observable dialogue exhibited by teachers and students classified into thirty-four specific categories of the Inquiry Analysis System.[23]

4. Inquiry into Inquiry - A sincere effort has been made in this training program to "practice what we preach." The content of the program consists of a method designed to develop autonomous inquirers, learners who have the understanding and skill to function independently of a tightly controlled learning environment. Consequently, an effort has been made to create the same learning conditions for participants in this training program through open active dialogue, and freedom to inquire, explore, and accommodate according to the individual needs and abilities of the participants.

5. Influence - Contacts of the teacher set a pattern of influence that spreads through the classroom; the influence of the teacher, more than any other individual, sets the climate of the class. The teacher controls his own influence primarily by using appropriate statements during spontaneous interaction.[24] For the ISD project, influence is defined as the degree to which a student is dependent or independent upon the teacher to participate in the learning activity as assessed by the directness-indirectness measurement of the Inquiry Analysis Program.

6. Inquiry Strategies - Inquiry strategies are developed by grouping inquiry skills into specific patterns of instruction. The strategies are composed of inquiry dialogue, structural skills, and affective skills which regulate the pattern of behavior that spreads throughout the classroom involving direction and freedom on the parts of the teacher and the

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[23]Alan T. Seagren et al, Inquiry Skills Component III: Inquiry Behaviors and An Inquiry Discussion Model, Trainer Assessment, Kansas City, Missouri: Mid-continent Regional Educational Laboratory, 1969, Appendix A.

[24]Ned A. Flanders, Teacher Influence: Pupil Attitudes and Achievement, U.S. Office of Education Cooperative Research Project No. 397 (Minneapolis: University of Minnesota, 1960,) p. 11.

students. For the ISD project, groupings of skills or strategies for specific models of inquiry instruction are identified as TDI,[25] Teacher Directed Inquiry, TSDI,[26] Toward Student Directed Inquiry, and PCI,[27] Pupil Centered Inquiry.

7. Inquiry Process - Inquiry process is defined as the total act of inquiring. The process includes skills, strategies, phases, and planning with result in inquiry.

8. Inquiry Phases - Inquiry phases are the specific functions making up the process of inquiry instruction. The ISD project specified ten functions as inquiry phases which are exclusively identifiable in inquiry instruction. These functions concerned: 1) factual data, 2) analyses, interpretation, relationships, 3) hypotheses, 4) process of inquiry into inquiry, 5) feelings and attitude, 6) procedures, 7) sensual observations, 8) identification of goal or problem, 9) assessment of content, goal or process, 10) non-inquiry behavior.

9. Inquiry Planning - Inquiry planning is preparation by the teacher or student for inquiry activities. This activity would include selection of: 1) specific model of inquiry, 2) appropriate inquiry dialogue skills, 3) structuring behaviors, and 4) affective behaviors. Selection and implementation of structural and affective behaviors are activities of teacher and student.

10. Cognitive or Structuring Inquiry Skills - Cognitive inquiry skills are of an organizational nature which are a part of or promote inquiry.

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[25]Alan T. Seagren, et al, Inquiry Skills Component III: Inquiry Behavior and An Inquiry Discussion Model, Kansas City, Missouri: Mid-contient Regional Educational Laboratory, 1969, p. 13.

[26]Ibid.

[27]Alan T. Seagren, et al, Pupil Centered Inquiry V, Unpublished work papers for Component V.

Cognitive inquiry skills identified in the ISD program are 1) goal setting, 2) data collecting, 3) data interpretation, 4) hypothesizing, 5) decision making, and 6) assessment of goal achievement.

11. Affective Behaviors - Affective behaviors are expressions of feelings, attitudes, and values which are a part of or promote inquiry. The ISD program includes the broad behaviors of 1) openness, and 2) inquiry-orientation with specific verbalized behaviors within each of the categories.

12. Behavioral Analysis of Teaching - Behavioral analysis of teaching is the process of analyzing the teaching act by focusing on specific skills or behaviors on the part of the teacher or student. Both subjective and objective types of analysis can be made but the limiting factor is that the behavior must be observable and can be identified.

COMPONENTS OF THE PROGRAM

There are many strategies for organizing and structuring educational programs. Systems analysis, currently used in business, defense and aerospace industries and found to be an effective organizational technique, appears to be applicable for planning and controlling purposes in the field of education as well. The lattice technique has been chosen as the organizational strategy for this program because of its appropriateness to the instructional requirements. Basic to the lattice technique is the breaking down of the curriculum into its component parts and elements and organizing these components and elements into logical systematic sequences. The sequencing of the components in this program begins with the simple kinds of skills and behaviors and proceeds to those which are more complex. Therefore, the program also proceeds from the teacher centered classroom to the situation where a pupil may be independently involved in inquiry situations. The typical teacher today is likely to be in front of a classroom of 30 students where he is in charge. To change or modify this behavior, the

program begins from the point where most teachers presently are and attempts to provide teachers with the understanding and skills necessary to change and modify their behavior to promote pupil centered learning.

Component I - Orientation to Inquiry

Goal - A general orientation to the instructional style emphasizing the inquiry process.

Component I was designed to be an initial effort to develop a common understanding among teachers of the concept of inquiry and to provide an overview of the entire project. Attention was focused on (1) attempting to develop a common conceptualization of the terms of inquiry and (2) the ability of participants to identify classroom discussion episodes as inquiry or non-inquiry on the basis of their present understanding.

Component II - Inquiry Influence

Goal - To develop within teachers interaction analysis interpretation skills and an awareness of influence patterns.

The intent of this component was to enable teachers to better understand the impact of verbal behavior on students. The objective was to have participants gradually structure the verbal influence pattern to move students from teacher directed student dependent inquiry to increasing the student's independence of teacher direction. Practice was given to participants in controlling their influence behavior. Another major goal of this component was to make teachers aware that they can control their influence behavior in predetermined ways. The primary focus of instruction was the 10 basic categories from Flanders Interaction Analysis System. The study of Flanders Interaction Analysis System per se does not necessarily facilitate inquiry. In terms of the sequence of the program it is a necessary step to provide a basis for further components and to provide teachers with experiences in interpreting and modifying specific dimensions of their behavior.

Component III - Inquiry Skills

Goal - To develop within teachers inquiry skills which promote the development of inquiry skills in pupils.

Emphasis in this component focused on the Inquiry Analysis System. The Inquiry Analysis System consists of an expansion of the 10 basic categories of Flanders Interaction Analysis into 34 sub-categories which focus on specific inquiry behaviors. Participants were also introduced to cognitive or structuring inquiry skills and affective inquiry behaviors. The primary emphasis in Component III was an expansion of the influence dimension to the inquiry teaching skills.

Component IV - Behavioral Objectives

Goal - To develop within teachers skills in analyzing and formulating inquiry behavior objectives and plans.

This component is designed to transfer the teachers attention from acquiring specific teaching skills to applying these skills within a framework of planning for inquiry in the classroom. In general it was designed to help the teacher recognize how instructional objectives are related to teaching skills and how to incorporate instructional objectives in their planning and teaching. Practice was provided to gain experience in planning and utilizing inquiry teaching style in both micro teaching and classroom situations.

Component V - Pupil Centered Inquiry

Goal - The goal here is to develop within teachers behaviors which promote pupil centered inquiry.

Emphasis in this component focused on both teacher and pupil behaviors which exemplify pupil centered inquiry. Skills, inquiry phases, and affective behaviors were identified, analyzed, and practiced by both teachers and pupils. Both small and large group inquiry were analyzed and practiced, giving participants experience with new inquiry settings. Effective teacher-pupil decision

making was stressed, preparing both teachers and pupils for more self-directed inquiry.

Component VI - Affective Behaviors Which Promote Inquiry

Goals - To develop within pupils affective behaviors which are supportive of and necessary for group inquiry.

This component is designed to shift focus from teacher behaviors that promote inquiry to those affective and social behaviors which need to be developed in students for effective inquiry. Students are moved toward positions of responsibility which allows them to be more independent of the teacher and to function in a cooperative role in a climate of relative autonomy.

This strategy involves more responsibility and independence on the part of pupils. They may be involved in both cooperative efforts with other students or independent of others. Pupils become more independent from the teacher at certain critical decision-making points.

MODELS

To assist teachers in analyzing their own behavior and selecting appropriate alternatives, models of teaching behaviors have been developed. These models were not developed with the intent that they be emulated by the teacher or superimposed upon the teacher. They are intended to be utilized as guidelines by teachers in assisting them in selecting the alternatives and assessing the outcomes. Inquiry teaching and learning take a variety of forms varying according to the amount of freedom given to the learner to make decisions on the content and the process to be followed. The various teaching and learning forms are called inquiry strategies. In this project three distinct inquiry strategies have been conceptualized and developed into models. These models have been used as a part of the instructional packages in the various components. They provide

a theoretical framework on which to base the instruction which focused on influence, skills, and behavioral objectives. As indicated in the design of the components, these also proceed from simple to complex in terms of the prerequisite skills and behaviors on the part of teachers. Each of the models is specified in terms of ranges of percentages and behavioral keys which are derived from the ten basic categories of Flanders' Interaction Analysis and the subcategories of the Inquiry Analysis System.

1. TDI - Teacher-Directed Inquiry

This strategy is teacher and question centered with the teacher leading the learners to desired discussions and decisions. Students inquire into the concepts or problems designated by the teacher and in the designated process (leading questions prepared by the teacher and asked in a logical sequence).

2. TSDI - Toward Student-Directed Inquiry

This strategy is still teacher directed, but it encourages more student ideas initiated by the learners themselves. It is more idea centered than question centered and more pupil centered than teacher centered. The teacher utilizes more indirect influence behaviors to encourage the students to inquire freely. Opportunities for students to make decisions as to content (after content goals have been identified by the teacher) are available in this strategy. The teacher still directs the process of inquiry; but again, the students have more freedom to make dicisions as to next steps and process evaluation.

3. PCI - Pupil-Centered Inquiry

This strategy is student centered. The learners have much freedom under the direction of the teacher to determine both content and process. It may be class inquiry, group inquiry, or individual inquiry. The teacher assumes the role of the prober, organizer, and facilitator rather than the role of information giver. Once a concept or problem is attempted by the learners, either from their own decision or from the suggestions of the teacher, they

proceed to determine the data available, the hypothesis to investigate, the validity of the data, the determination of conclusions, and the assessment and application of conclusions reached.

These models are specified in terms of behaviors and skills which are congruent with the instruction received in the components of the program.

TRAINING

For purposes of training, the following have been identified:

T_1's - Specialists at the University of Nebraska-Lincoln who have participated in the development of these materials and who are competent to train trainers.

T_2's - Trainers who have gone through the program components and who have received special training in use of the materials. They will be competent to intervene, make adaptations and select alternatives within the programs for specific needs and requirements of the school district and for individual teachers.

T_3's - Classroom teachers for whom the training in these components was designed.

It is fundamental to the utilization of this staff development program that trainers (T_2's) who desire to work with classroom teachers (T_3's) will receive training from the individuals who developed the program (T_1's).

EVALUATION

Four types of evaluation data are collected in the ISD program.

1. Teacher and Student Classroom Performance data are collected using three verbal behavior observational instruments:

   a. The Inquiry Analysis System (IAS) is a modification of Flanders' Interaction Analysis which codes thirty-four subcategories of behaviors. This instrument is used with Components I to IV. This provides data on where each participant is in relation to the

Inquiry Models since they are described in terms of some of these categories.

b. The Revised Inquiry Analysis System (Revised IAS) is a three-column simultaneous coding of teacher verbal behaviors, student verbal behaviors, and cognitive inquiry behaviors. It is used in conjunction with Component V. The PCI model is expressed in terms of these categories of behaviors.

c. The Affective Behavior Checklist is a system which codes seventeen verbally expressed affective inquiry behaviors. These are specific behaviors which are categorized as "openness" or"inquiry orientation". This instrument is used with Component VI.

2. Written Pre-Posttests on each component are as follows:

a. Component I Pre-Posttest involves the identification of ten audio-taped classroom episodes as examples of either inquiry or non-inquiry. It is used to indicate changes in the participant's perceptions of what constitutes an inquiry session.

b. Component II Pre-Posttest provides six items which give information on the degree to which each participant can interpret interaction analysis coding. The pretest may be used to determine the level of comprehension of IA before instruction so sessions may be modified accordingly. The posttest results will enable the trainer to determine the success of instruction in this component.

c. Component III Pre-Posttest is an essay question which asks the participant to describe teaching behaviors utilized in student-centered inquiry discussion. The number and specificity of behaviors mentioned provide an index to the participant's concepts of this type of inquiry.

d. Component IV Pre-Posttest provides the trainer with information on the ability of each participant to (1) identify behavioral objectives, (2) write behavioral objectives, (3) classify according to the Taxonomy,[28] and (4) plan in terms of these factors. The pretest may be used to determine appropriate instruction in this component and to determine effectiveness of instruction.

e. Component V Pre-Posttest is in two parts. The first part consists of four written items on the definition of PCI, teacher and student behaviors appropriate for PCI, and interpretation of coding from the Revised IAS instrument. In the second part, participants are asked to identify PCI episodes from five videotaped sessions. Concepts of the PCI strategy are reflected by this instrument.

f. Component VI Pre-Posttest includes ten videotaped episodes from which particpants are asked to identify affective behaviors. The trainer can determine to which affective inquiry behaviors each participant is sensitive and which ones need additional work.

3. Participant opinionnaires are used in each component to determine the teacher's attitudes and feelings about the strengths and weaknesses of instruction and to get recommendations for changes. This also provides the participant with a reason to review the component's activities and to put them in perspective.

4. Pupil attitudes are determined in two ways: student questionnaires are given at the end of Component V and of Component VI. After participation in small group activities, students are orally interviewed on their feelings about the session.

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[28]Benjamin S. Bloom, ed. Taxonomy of Educational Objectives, Handbook I: Cognitive Domain, (New York: David McKay Company, Inc.), 1956.

EVALUATION OF ISD PROGRAM

As previously mentioned the results of the field test are reported in the 1971-72 ISD Field Test Assessment Report.[29] The effectiveness of the program design is reflected in selected findings and conclusions from the study:

1. Favorable attitudes by both trainers and participating teachers were expressed toward microteaching and critiques, group discussions, coding with observational techniques, and the program in general.
2. All participating teachers exhibited more indirect, open, student-centered, and analysis level behavioral patterns.
3. All participating teachers improved their ability to plan in behavioral terms but did not often consider the Taxonomy or integrate behavioral objectives and other instructional skills.
4. Student involvement increased with a total mean of 21.1 percent student talk to 81.1 percent.
5. The variety of specific cognitive inquiry behaviors increased in three of the four trainers' groups. In all cases, the amount of factual data was reduced while data interpretation and analysis were increased (14.1 percent to 39.4 percent). Other behavior categories which increased included "affective," "procedures," "sensory observations," "problem identification," and "assessment."
6. Use of specific affective inquiry behaviors by participating teachers and their students increased, with "openness" behaviors occurring more frequently than "inquiry orientation" behaviors.
7. Results of student questionnaires indicated that students enjoyed their work; they felt they learned both content and process and would like to continue with inquiry. They tended to prefer inquiry to other learning strategies.

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[29]Wright, et. al., op. cit., 1971-1972 ISD Field Test Assessment Report.

8. All trainers were enthusiastic about the ISD program in inquiry. Feelings were unanimous that trainers needed released time, that technical quality of video and audio training tapes should be improved, and that participants should have feedback from the Pre-Post Tests.
9. All teachers indicated a positive feeling about the ISD program. All those completing final opinionnaires indicated that they would recommend the program to other teachers, that they planned to continue use of inquiry in the future, and that their students enjoyed it. They especially liked an opportunity to view their own behaviors and the use of video recordings. All indicated that the program had been a beneficial experience for them.
10. Students responded positively to the program indicating that they enjoyed it and felt they learned both content and process. In general, they wanted to use inquiry more as they preferred this type of instruction.[30]

The general goals of the ISD program were achieved. Data concerning objectives for each component are reported in the assessment report.[31]

SUMMARY

The need for programs designed to increase the competencies of professionals will continue to exist because 1) the expectations of society will continue to change in terms of roles and responsiblities of teachers; 2) the research related to teaching and learning will provide new insights, and 3) new and innovative instructional materials will be available which require shifts in teaching models and strategies.

Therefore, there appears to be a need for staff development programs designed to improve and increase the effectiveness of professional educators. On the basis

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[30]Wright, et. al., op. cit., 1971-1972 ISD Field Test Assessment Report.

[31]Ibid.

of the experience with the ISD program the following should be considered when designing staff development programs:

1. Teachers are decision-makers

   Programs should be designed to provide teachers with a broad base of understanding of teaching skills and behaviors as well as training in specific skills and behaviors. This will assist teachers in selecting the most appropriate strategy or behavior from a wide range of alternatives.

2. Teaching process and curriculum materials

   Program should be designed to assist teachers in modifying their behaviors to be congruent and consistent with 1) the intent of the materials, 2) the theory on which the materials were developed, 3) the activities designed or suggested to achieve the objective of the materials.

3. Modeling behaviors

   Programs should provide experiences within the context or frame of reference utilizing the basic strategies or teaching models which teachers are expected to implement with students in their classroom.

4. Individualized

   Programs should be designed with consideration given to the range of competencies, levels of readiness and rate of progress of participants.

5. Theory to Practice

   Programs should be designed so that experiences provided include opportunities for and experience in sensitization, understanding, practice, implementation and assessment. (Refer to Theory to Practice Model$_1$, page 12).

6. Simple to Complex

   Programs should be organized into logical systematic sequences so the

more sophisticated and complex skills and behaviors are added to the simpler and more commonly known teaching behaviors or methods.

7. Feedback and Assessment

   Programs should provide for continuous feedback to participants about their progress in terms of program objectives and subsequent experiences should build on the demonstrated competencies or provide opportunities for remediation.

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